

=> file reg  
FILE 'REGISTRY' ENTERED AT 10:30:49 ON 02 OCT 2003  
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=> display history full l1-

FILE 'REGISTRY' ENTERED AT 09:42:54 ON 02 OCT 2003  
L1 234 SEA (B(L)N)/ELS (L) 2/ELC.SUB  
E ALUMINUM/CN  
L2 1 SEA ALUMINUM/CN  
E SILICON/CN  
L3 1 SEA SILICON/CN  
L4 1 SEA TITANIUM/CN  
FILE 'HCA' ENTERED AT 09:48:57 ON 02 OCT 2003  
L5 5470 SEA CBN OR C(A) (BN OR BORON##(A)NITRIDE#) OR (CUBIC? AND  
((BORON## OR B) (A)NITRIDE# OR L1))  
FILE 'REGISTRY' ENTERED AT 09:49:43 ON 02 OCT 2003  
L6 E OXYGEN/CN  
1 SEA OXYGEN/CN  
FILE 'HCA' ENTERED AT 09:52:10 ON 02 OCT 2003  
L7 1637 SEA L6 AND GETTER? OR ((OXYGEN# OR O2 OR O) (3A)GETTER?)  
L8 394185 SEA L2 OR (ALUMINUM# OR AL) (2A) (METAL#### OR ELEMENTAL?  
OR FILM? OR LAYER? OR COAT?)  
L9 423955 SEA L3 OR (SILICON OR SI) (2A) (METAL#### OR ELEMENTAL? OR  
FILM? OR LAYER? OR COAT?)  
L10 178725 SEA L4 OR (TITANIUM# OR TI) (2A) (METAL#### OR ELEMENTAL?  
OR FILM? OR LAYER? OR COAT?)  
FILE 'REGISTRY' ENTERED AT 09:55:32 ON 02 OCT 2003  
L11 6727 S (M(L)C)/ELS (L) 2/ELC.SUB  
L12 1702 SEA L11 AND ?CARBID?/CNS  
L13 2448 SEA (M(L)N)/ELS (L) 2/ELC.SUB  
L14 1617 SEA L13 AND ?NITRID?/CNS  
FILE 'HCA' ENTERED AT 10:10:37 ON 02 OCT 2003  
L15 51629 SEA L12 OR METAL####(W)CARBIDE#  
L16 78447 SEA L14 OR METAL####(W)NITRIDE#  
L17 8827 SEA GETTER?  
L18 3 SEA L5 AND L7  
L19 349 SEA L5 AND L8  
L20 620 SEA L5 AND L9  
L21 378 SEA L5 AND L10  
L22 3 SEA L19 AND L17  
L23 2 SEA L20 AND L17  
L24 4 SEA L21 AND L17

L25 528 SEA L5 AND L15  
L26 745 SEA L5 AND L16  
L27 0 SEA L25 AND L17  
L28 2 SEA L26 AND L17  
L29 5 SEA L18 OR L22 OR L23 OR L24 OR L28

FILE 'WPIX, JAPIO' ENTERED AT 10:21:59 ON 02 OCT 2003  
L30 2809 SEA CBN OR C(A) (BN OR BORON##(A)NITRIDE#) OR (CUBIC? AND  
((BORON## OR B) (A)NITRIDE# OR L1))  
L31 1754 SEA CBN OR C(A) (BN OR BORON##(A)NITRIDE#) OR (CUBIC? AND  
((BORON## OR B) (A)NITRIDE# OR L1))

TOTAL FOR ALL FILES

L32 4563 SEA L5  
L33 4188 SEA GETTER?  
L34 2928 SEA GETTER?  
TOTAL FOR ALL FILES  
L35 7116 SEA GETTER?  
L36 1 SEA L30 AND L33  
L37 0 SEA L31 AND L34  
TOTAL FOR ALL FILES  
L38 1 SEA L32 AND L35

FILE 'HCA' ENTERED AT 10:27:43 ON 02 OCT 2003  
L39 2389 SEA (L6 OR OXYGEN# OR O2 OR O) (2A) TRAP?  
L40 1 SEA L5 AND L39  
L41 0 SEA L40 NOT L29

FILE 'WPIX, JAPIO' ENTERED AT 10:28:24 ON 02 OCT 2003  
L42 212 SEA (L6 OR OXYGEN# OR O2 OR O) (2A) TRAP?  
L43 90 SEA (L6 OR OXYGEN# OR O2 OR O) (2A) TRAP?  
TOTAL FOR ALL FILES  
L44 302 SEA L39  
L45 0 SEA L42 AND L30  
L46 0 SEA L43 AND L31  
TOTAL FOR ALL FILES  
L47 0 SEA L44 AND L32

FILE 'REGISTRY' ENTERED AT 10:30:49 ON 02 OCT 2003

=> file wpix  
FILE 'WPIX' ENTERED AT 10:31:04 ON 02 OCT 2003  
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FILE LAST UPDATED: 1 OCT 2003 <20031001/UP>  
MOST RECENT DERWENT UPDATE: 200363 <200363/DW>  
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

=> d 136 1 max

L36 ANSWER 1 OF 1 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN  
 AN 1978-08257A [04] WPIX  
 TI Cubic boron nitride particles - coated  
 with nickel, then with e.g. titanium, aluminium or copper.  
 DC E36 L02  
 IN PENNY, A L  
 PA (DBEE) DE BEERS IND DIAMOND DIV PTY LTD  
 CYC 1  
 PI ZA 7606480 A 19771101 (197804)\*  
 PRAI ZA 1976-6480 19761028  
 IC C01B000-00  
 AB ZA 7606480 A UPAB: 19930901  
 A metal coated cubic boron nitride  
 particle contains >=2 layers of metals. The inner layer pref. is a  
 good oxygen getter such as titanium, aluminium or copper  
 and the outer layer pref. nickel.  
 FS CPI  
 FA AB  
 MC CPI: E31-Q; L02-F03; L02-J01A  
 CMC UPB 19930924  
 M3 \*01\* C800 C107 C803 C806 C802 C807 C804 B720 B803 B831 B105 B730  
 N000 Q334 Q451 Q454 M740 M750 M411 M902

=> file hca  
 FILE 'HCA' ENTERED AT 10:31:45 ON 02 OCT 2003  
 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
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=> d 129 1-5 ibib abs hitstr hitind

L29 ANSWER 1 OF 5 HCA COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 138:372891 HCA  
 TITLE: Preparation of high toughness low oxygen  
 cubic boron nitride  
 ceramics by high temperature and pressure  
 process using oxygen-trapping additives  
 Zimmermann, Michael H.; Einset, Erik O.  
 General Electric Company, USA  
 PCT Int. Appl., 14 pp.  
 SOURCE: CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003040062	A2	20030515	WO 2002-US34323	20021023
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,				

CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD,  
 GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,  
 LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
 NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ,  
 TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ,  
 BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE,  
 BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU,  
 MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
 GW, ML, MR, NE, SN, TD, TG

US 2003099587 A1 20030529 US 2001-1573 20011102

US 2001-1573 A 20011102

## PRIORITY APPLN. INFO.:

AB A method for improving the toughness of a **CBN** product made by a high temp./high pressure (HP/HT) process begins by forming a blend of an **oxygen-getter** (such as Al, Si or Ti, or carbides or nitrides of these metals) and **CBN** product-forming feedstock. The blend is subjected to a high temp./high pressure (HP/HT) process for forming a **CBN** product. The amt. of **oxygen-getter** in the blend is sufficient to improve the toughness of the **CBN** product. The resulting **CBN** product desirably has an oxygen content of .ltorsim.300 ppm. The HP/HT process is conducted with or without catalytic materials (such as LiH, Li<sub>3</sub>N, LiNH<sub>2</sub> or LiOH).

IT 7782-44-7, Oxygen, processes  
(content in **cBN**; prepn. of high toughness low oxygen  
cubic boron nitride ceramics by high  
temp. and pressure process using oxygen-trapping additives)

RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O=O

IT 10043-11-5P, Boron nitride, preparation  
(cubic-phase; prepn. of high toughness low oxygen  
cubic boron nitride ceramics by high  
temp. and pressure process using oxygen-trapping additives)

RN 10043-11-5 HCA

CN Boron nitride (BN) (8CI, 9CI) (CA INDEX NAME)

B=N

IT 7429-90-5, Aluminum, processes 7440-21-3, Silicon,  
processes 7440-32-6, Titanium, processes  
(**oxygen-getters**; prepn. of high toughness low  
oxygen cubic boron nitride ceramics  
by high temp. and pressure process using oxygen-trapping  
additives)

RN 7429-90-5 HCA

CN Aluminum (8CI, 9CI) (CA INDEX NAME)

Al

RN 7440-21-3 HCA  
 CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

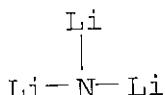
Si

RN 7440-32-6 HCA  
 CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

IT 26134-62-3, Lithium nitride (Li<sub>3</sub>N)  
 (prepn. of high toughness low oxygen **cubic**  
**boron nitride** ceramics by high temp. and  
 pressure process using oxygen-trapping additives)

RN 26134-62-3 HCA  
 CN Lithium nitride (Li<sub>3</sub>N) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM C04B035-83

CC 57-2 (Ceramics)

ST oxygen trapping **cubic boron nitride**  
 prodn toughness catalyst

IT Carbides  
 (metal, **oxygen-getters**; prepn. of high  
 toughness low oxygen **cubic boron**  
**nitride** ceramics by high temp. and pressure process using  
 oxygen-trapping additives)

IT Nitrides  
 (**oxygen-getters**; prepn. of high toughness low  
 oxygen **cubic boron nitride** ceramics  
 by high temp. and pressure process using oxygen-trapping  
 additives)

IT Fracture toughness  
 Heat treatment  
 (prepn. of high toughness low oxygen **cubic**  
**boron nitride** ceramics by high temp. and  
 pressure process using oxygen-trapping additives)

IT 7782-44-7, Oxygen, processes  
 (content in cBN; prepn. of high toughness low oxygen  
**cubic boron nitride** ceramics by high  
 temp. and pressure process using oxygen-trapping additives)

IT 10043-11-5P, **Boron nitride**, preparation  
 (cubic-phase; prepn. of high toughness low oxygen

IT cubic boron nitride ceramics by high temp. and pressure process using oxygen-trapping additives) processes 7429-90-5, Aluminum, processes 7440-21-3, Silicon, processes 7440-32-6, Titanium, processes (oxygen-getters; prepn. of high toughness low oxygen cubic boron nitride ceramics by high temp. and pressure process using oxygen-trapping additives)

IT 1310-65-2, Lithium hydroxide (LiOH) 7580-67-8, Lithium hydride (LiH) 7782-89-0, Lithium amide (LiNH<sub>2</sub>) 26134-62-3, Lithium nitride (Li<sub>3</sub>N) (prepn. of high toughness low oxygen cubic boron nitride ceramics by high temp. and pressure process using oxygen-trapping additives)

L29 ANSWER 2 OF 5 HCA COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 134:269766 HCA  
 TITLE: Metal-coated abrasive particles and oxygen-scavenger metal for sintered metal-bonded abrasive tools  
 INVENTOR(S): Palgren, Gary M.  
 PATENT ASSIGNEE(S): 3m Innovative Properties Co., USA  
 SOURCE: PCT Int. Appl., 42 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001023630	A1	20010405	WO 2000-US8787	20000403
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6416560	B1	20020709	US 1999-405466	19990924
EP 1218556	A1	20020703	EP 2000-920050	20000403
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
JP 2003510193	T2	20030318	JP 2001-527010	20000403
PRIORITY APPLN. INFO.:			US 1999-405466	A 19990924
			WO 2000-US8787	W 20000403

AB The metal-coated abrasive particles are dispersed in a fused metal matrix contg. the binder and an O<sub>2</sub>-scavenging metal powder. The abrasive particles are preferably based on diamond and/or

**cubic**-BN grit, and are used for manuf. of metal-bonded abrasive wheels or cutting tools having increased resistance to wear. The bonding metal or alloy is typically Co, W, Cu, Fe, Ni, Sn, Cr, and/or bronze. The O<sub>2</sub>-scavenging metal powder is typically selected from Al, Ca, Mg, Ti, Si, and/or Zr, esp. as a **getter** at 0.1-10% in a binder mixt. for use with **Ti** **coated** grit to decrease oxidn. loss in hot-press bonding or sintering at 700-1000.degree.. The typical preform for pressure-sintered abrasives contains: (a) Cu foil 0.254 mm thick as the base; (b) metal-powder tape contg. mainly Cu, Fe, and WC powders with temporary resin binder and Al powder as the **getter**; and (c) top layer of diamond powder precoated with **Ti** film .apprx.1 .mu.m thick as the binder. The 3-layer preforms are suitable for lamination to manuf. grinding wheels or cutting tools sintered in air with controlled heating at 420-1007.degree. and the pressure of 100-400 kg/cm<sup>2</sup>.

IT 7440-32-6, **Titanium**, uses  
(coating, abrasive grit with; metal-coated abrasive powders in fused binder matrix contg. O<sub>2</sub>-scavenger metal for grinding wheels or cutting tools)

RN 7440-32-6 HCA  
CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

IT 10043-11-5, **Boron nitride**, uses  
(**cubic**, sintered tools with; metal-coated abrasive powders in fused binder matrix contg. O<sub>2</sub>-scavenger metal for grinding wheels or cutting tools)

RN 10043-11-5 HCA  
CN Boron nitride (BN) (8CI, 9CI) (CA INDEX NAME)

B—N

IT 7429-90-5, **Aluminum**, uses 7440-21-3, **Silicon**, uses  
(**oxygen-getter**; metal-coated abrasive powders in fused binder matrix contg. O<sub>2</sub>-scavenger metal for grinding wheels or cutting tools)

RN 7429-90-5 HCA  
CN Aluminum (8CI, 9CI) (CA INDEX NAME)

Al

RN 7440-21-3 HCA  
CN Silicon (7CI, 8CI, 9CI) (CA INDEX NAME)

Si

IC ICM C22C026-00  
 ICS C09K003-14; B24D003-10  
 CC 56-4 (Nonferrous Metals and Alloys)  
 Section cross-reference(s): 57  
 ST abrasive grit metal bonded tool sintering; diamond grit metal binder  
 abrasive wheel sintering; **titanium coated**  
 diamond powder sintering alloy binder  
 IT **Getters**  
 (O<sub>2</sub> scavengers; metal-coated abrasive powders in fused  
 binder matrix contg. O<sub>2</sub>-scavenger metal for grinding wheels or  
 cutting tools)  
 IT 7440-32-6, **Titanium**, uses 7440-47-3, Chromium,  
 uses 7440-67-7, Zirconium, uses  
 (coating, abrasive grit with; metal-coated abrasive  
 powders in fused binder matrix contg. O<sub>2</sub>-scavenger metal for  
 grinding wheels or cutting tools)  
 IT 10043-11-5, **Boron nitride**, uses  
 (cubic, sintered tools with; metal-coated abrasive  
 powders in fused binder matrix contg. O<sub>2</sub>-scavenger metal for  
 grinding wheels or cutting tools)  
 IT 7429-90-5, **Aluminum**, uses 7439-95-4, **Magnesium**, uses  
 7439-96-5, **Manganese**, uses 7440-21-3, **Silicon**, uses  
 7440-70-2, **Calcium**, uses  
 (oxygen-getter; metal-coated abrasive powders  
 in fused binder matrix contg. O<sub>2</sub>-scavenger metal for grinding  
 wheels or cutting tools)  
 REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L29 ANSWER 3 OF 5 HCA COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 127:310293 HCA  
 TITLE: Cutting tips coated with hard film layers  
 including **cubic boron nitride** for wear resistance in  
 rough-stage cutting  
 INVENTOR(S): Inspektor, Aharon  
 PATENT ASSIGNEE(S): Kennametal Inc., USA  
 SOURCE: PCT Int. Appl., 38 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9738151	A1	19971016	WO 1997-US838	19970115
W: AU, BR, CA, CN, JP, KR, MX, RU, SG				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,				
PT, SE				
US 5976716	A	19991102	US 1996-627464	19960404

CA 2248692	AA	19971016	CA 1997-2248692	19970115
AU 9717042	A1	19971029	AU 1997-17042	19970115
AU 706148	B2	19990610		
EP 900287	A1	19990310	EP 1997-903006	19970115
EP 900287	B1	20020904		
R: AT, BE, CH, DE, ES, FR, GB, IT, LI, NL, SE				
CN 1215437	A	19990428	CN 1997-193587	19970115
BR 9708499	A	19990803	BR 1997-8499	19970115
JP 2000508377	T2	20000704	JP 1997-536167	19970115
AT 223517	E	20020915	AT 1997-903006	19970115
ZA 9701602	A	19970829	ZA 1997-1602	19970225
MX 9807847	A	20000531	MX 1998-7847	19980925
KR 2000005021	A	20000125	KR 1998-707641	19980926
US 6054185	A	20000425	US 1998-208567	19981209
US 1996-627464 A 19960404				
WO 1997-US838 W 19970115				

## PRIORITY APPLN. INFO.:

AB The cutting tips typically manufd. from sintered carbide alloys are coated with: (a) adhesion-promoting film, esp. of a **getter** -type metal; (b) sequential hard interlayer films of B-C, B-C-N, B-N, and then B-C-N; and (c) the top film of **cubic** BN for wear resistance. The adhesion layer is selected from Ti, Zr, Hf, Mg, and/or **Al** as reactive **metals**. The resulting multilayer coating is typically 1-5 .mu.m thick, and is suitable for the sintered WC-Co alloy tips that can be used for rough-stage cutting as a substitute for conventional surface grinding of metals and alloys.

IT 10043-11-5, **Boron nitride (BN)**, uses  
 (cubic, hard film, coating with; cutting tips coated with hard interlayers and **cubic boron nitride** top film for wear resistance in rough-stage cutting)

RN 10043-11-5 HCA  
 CN Boron nitride (BN) (8CI, 9CI) (CA INDEX NAME)

## B≡N

IT 7429-90-5, **Aluminum**, uses 7440-32-6,  
 Titanium, uses  
 (film, coating interlayers with; cutting tips coated with hard interlayers and **cubic boron nitride** top film for wear resistance in rough-stage cutting)

RN 7429-90-5 HCA  
 CN Aluminum (8CI, 9CI) (CA INDEX NAME)

## Al

RN 7440-32-6 HCA  
 CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

IT 10043-11-5D, **Boron nitride**,  
nonstoichiometric  
(interlayer, hard coating with; cutting tips coated with hard  
interlayers and **cubic boron nitride**  
top film for wear resistance in rough-stage cutting)  
RN 10043-11-5 HCA  
CN Boron nitride (BN) (8CI, 9CI) (CA INDEX NAME)

B≡N

IC ICM C23C028-04  
ICS C23C028-00; C23C014-06; C23C016-34; B23B027-14  
CC 56-4 (Nonferrous Metals and Alloys)  
Section cross-reference(s): 57  
ST sintered cutting tool multilayer hard coating; **boron**  
**nitride** top coating cutting tool; carbide alloy tool  
multilayer hard coating  
IT Coating materials  
(abrasion-resistant, multilayer; cutting tips coated with hard  
interlayers and **cubic boron nitride**  
top film for wear resistance in rough-stage cutting)  
IT Cutting tools  
(hard coating on; cutting tips coated with hard interlayers and  
**cubic boron nitride** top film for wear  
resistance in rough-stage cutting)  
IT 10043-11-5, **Boron nitride** (BN), uses  
(**cubic**, hard film, coating with; cutting tips coated  
with hard interlayers and **cubic boron**  
**nitride** top film for wear resistance in rough-stage  
cutting)  
IT 11136-82-6 65155-35-3  
(cutting tools, coating on; cutting tips coated with hard  
interlayers and **cubic boron nitride**  
top film for wear resistance in rough-stage cutting)  
IT 7429-90-5, Aluminum, uses 7439-95-4, Magnesium,  
uses 7440-32-6, Titanium, uses 7440-58-6,  
Hafnium, uses 7440-67-7, Zirconium, uses  
(film, **coating** interlayers with; cutting tips  
coated with hard interlayers and **cubic boron**  
**nitride** top film for wear resistance in rough-stage  
cutting)  
IT 10043-11-5D, **Boron nitride**,  
nonstoichiometric 12656-55-2D, Boron carbide nitride,  
nonstoichiometric 60063-34-5D, Boron carbide, nonstoichiometric  
(interlayer, hard coating with; cutting tips coated with hard  
interlayers and **cubic boron nitride**  
top film for wear resistance in rough-stage cutting)

L29 ANSWER 4 OF 5 HCA COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 125:121161 HCA  
 TITLE: Tool inserts precoated for brazing to holders in air without using a vacuum furnace  
 INVENTOR(S): Iacovangelo, Charles D.  
 PATENT ASSIGNEE(S): General Electric Company, USA  
 SOURCE: Eur. Pat. Appl., 6 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 716159	A1	19960612	EP 1995-308626	19951130
R: AT, BE, DE, ES, FR, GB, IT				
US 5626909	A	19970506	US 1994-350572	19941207
JP 08268799	A2	19961015	JP 1995-315114	19951204
			US 1994-350572	19941207

PRIORITY APPLN. INFO.: AB The tool inserts manufd. from polycryst. diamond or **cubic**

BN are precoated for brazing in air at nominally 700.degree., without conventional use of a vacuum furnace or an inert atm. The tool inserts are precoated with: (a) the bonding layer of preferably W-(1-50%) Ti alloy or Cr, followed by intermediate heating at nominally 600-800.degree. to form carbide or nitride interlayer film for bonding to the tool substrate; and (b) protective layer of nominally Ag, Cu, Au, Pd, Pt, Ni, or Ni-Cr alloy for oxidn. The precoated tool inserts are suitable for resistance in air. The precoated tool inserts are suitable for brazing to the tool supports at .apprx.700.degree. in air, using a std. braze without a vacuum furnace or special atm. The tool inserts from sintered polycryst. diamonds can be brazed to WC alloy holder in 0.5-5 min at .apprx.700.degree. in air, after precoating by sputtering with the interlayer films .1toreq.1 .mu.m thick of W-Ti alloy, Ag, Ti (as **getter**), Ag, Cr, and Ni-Cr alloy, followed by diffusion heat treatment in Ar-5% H2 reducing atm. for 30-60 min at 700.degree..

IT 10043-11-5, Boron nitride (BN), uses  
 (cubic, sintered inserts; tool inserts precoated with metal interlayers for brazing to holders in air)

RN 10043-11-5 HCA  
 CN Boron nitride (BN) (8CI, 9CI) (CA INDEX NAME)

B=N

IT 7440-32-6, Titanium, processes  
 (getter, in coating; sintered tool inserts precoated with metal interlayers for brazing to holders in air)

RN 7440-32-6 HCA  
 CN Titanium (8CI, 9CI) (CA INDEX NAME)

Ti

IC ICM C23C014-18  
 ICS C23C014-58; C23C028-02; C23C030-00  
 CC 56-9 (Nonferrous Metals and Alloys)  
 Section cross-reference(s): 57  
 ST diamond sintered insert brazing tool air; **boron nitride** insert brazing tool air; metal interlayer diamond insert brazing tool  
 IT 10043-11-5, **Boron nitride** (BN), uses (cubic, sintered inserts; tool inserts precoated with metal interlayers for brazing to holders in air)  
 IT 7440-32-6, Titanium, processes (getter, in coating; sintered tool inserts precoated with metal interlayers for brazing to holders in air)

L29 ANSWER 5 OF 5 HCA COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 95:191308 HCA  
 TITLE: Effect of oxygen on the growth of **cubic boron nitride** using magnesium nitride (Mg<sub>3</sub>N<sub>2</sub>) as catalyst  
 AUTHOR(S): Sato, Tadao; Hiraoka, Hideo; Endo, Tadashi; Fukunaga, Osamu; Iwata, Minoru  
 CORPORATE SOURCE: Natl. Inst. Res. Inorg. Mater., Sakura, 305, Japan  
 SOURCE: Journal of Materials Science (1981), 16(7), 1829-34  
 CODEN: JMTSAS; ISSN: 0022-2461  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Cubic B nitride (cBN) was synthesized from hexagonal B nitride (hBN) under high pressure and high temp. using Mg<sub>3</sub>N<sub>2</sub> as catalyst. The yield and morphol. of cBN were investigated in relation to the O impurity of the BN-Mg<sub>3</sub>N<sub>2</sub> system. MgO pptd. as a by-product in this system and the amt. of the ppt. increased with an increase in the O content of the starting materials. The morphol. and surface patterns of cBN crystals synthesized using a hBN which contained O showed unusual features. The pptn. of MgO interfered with the free growth of cBN crystals. Purifn. of starting materials and addn. of Zr powder to the catalyst as an O getter increased the yield of cBN crystals showing smooth surfaces.

IT 7782-44-7, uses and miscellaneous (boron nitride conversion with magnesium nitride catalyst in presence of)

RN 7782-44-7 HCA  
 CN Oxygen (8CI, 9CI) (CA INDEX NAME)

O—O

IT 12057-71-5  
(catalyst, in conversion of hexagonal **boron nitride to cubic**, oxygen effect on)  
RN 12057-71-5 HCA  
CN Magnesium nitride (Mg<sub>3</sub>N<sub>2</sub>) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)  
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*  
IT 10043-11-5P, preparation  
(formation of **cubic**, with magnesium nitride catalyst,  
oxygen effect on)  
RN 10043-11-5 HCA  
CN Boron nitride (BN) (8CI, 9CI) (CA INDEX NAME)

B≡N

CC 57-6 (Ceramics)  
ST **boron nitride cubic** oxygen; magnesium  
nitride catalyst **boron nitride**  
IT 7782-44-7, uses and miscellaneous  
(**boron nitride** conversion with magnesium  
nitride catalyst in presence of)  
IT 12057-71-5  
(catalyst, in conversion of hexagonal **boron nitride to cubic**, oxygen effect on)  
IT 10043-11-5P, preparation  
(formation of **cubic**, with magnesium nitride catalyst,  
oxygen effect on)  
IT 1309-48-4P, preparation  
(formation of, in conversion of hexagonal **boron nitride** with magnesium nitride catalyst)  
IT 7440-67-7, uses and miscellaneous  
(**getter** for **oxygen**, with magnesium nitride,  
for conversion of hexagonal **boron nitride** to  
**cubic**)